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ABSTRACT

It is important that we reflect on the conceptual framework from which our study of language has emerged, since the problems, methods, and aims of what has been called modern linguistics are rapidly being replaced by the concerns of another framework or paradigm. Such new paradigms, to be viable, must not be distorted by starting points that unduly restrict analysis and research. Therefore, since the transformational (and neo-transformational) model is able to probe more deeply into the reality of language, often compensating for the inadequacies of the structural approach to account for the data, it is to be preferred. These richer theories illustrate advance through their demonstration, though incomplete and provisional, of the laws of language on a global scale. However, the charge of onesidedness as applied to the now-dominant perspective(s) is not easily answered. To the extent that it cannot be answered, the current "rationalist" efforts must be viewed as too limiting to account satisfactorily for the phenomena (language) they are attempting to explain. In the future, the mode of abstraction and directive for research must be critically appraised for the way they inform theory, fact, research, and application. The ultimate criterion for evaluation cannot incontrovertibly be an appeal to the concept "science"; the critic must be aware of his pre-scientific grounds for judgment. (Author/DB)

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"From Paradigm to Practice in Linguistics"

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As we move ahead--and at times slip back--in linguistic studies, what ought to gain in respect is that whatever analyses uncover or suggest about the nature of language, these analyses cannot replace their source in significance or honor. The richer the theory, the more complex and mysterious the phenomena of language appears to be. To this extent science is not king; the grammar book--traditional, structural, tagmemic, transformational, neotransformational, stratificational--is not the 'sourcebook' of grammar, but only a second hand account of that source. Both Miss Fidditch and Mr. Modern Grammarian have a conscious knowledge of grammatical rules that lend insight, accompanied by varying degrees of distortion and incompleteness, into the rather extensive preanalytical grammar that small children 'understand' and use skillfully, integrating sound, syntax, and semantics in ways that still pit the best theorists against each other for explanation. This is not to deny the achievements of linguists, for such achievements have significantly contributed to these observations.

As we push into the 1970's, we do well to reflect on the conceptual framework out of which our study of language has emerged. This is especially relevant since the problems, methods, and aims of what has been called modern linguistics (Chomsky

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still calls it that) are rapidly being replaced by the concerns of another conceptual framework or paradigm (to use a word that has various shades of meaning in Thomas Kuhn's "The Structure of Scientific Revolutions"[1]).

Says Susan Langer of a philosophy (cf. philosophy of science):

> It is characterized more by the formulations of its problems than by its solution of them. Its answers establish an edifice of facts; but its questions make the frame in which its picture of facts is plotted. They make more than the frame; they give the angle of perspective, the palette, the style in which the picture is drawn--everything except the subject. In our questions lie our principles of analysis, and our answers may express whatever those principles are able to yield.[2]

For reasons that should become increasingly evident, it is important to be reminded of our recent history in linguistics and the effects in practice of the still struggling paradigm.

Structural linguistics was to be 'scientific', with all the claims to precision and objectivity that are so often associated with that word. For example, no longer would we study language through notional definitions inconsistently mixed with functional criteria for establishing parts of speech. No longer would we attempt to use Latin grammar as a model for English grammar or pretend that there was any real significance to a universal grammar. Languages differed and must be considered on their own merit. The way of science was the way of inductive generalizations from observables. We would, in other words, stick to the facts as we saw them--or better, as they revealed themselves to us. Some would note the correlation of differing linguistic structures to differing cultural patterns

and develop a theory of linguistic relativity. Attention to the observable surface features of language would culminate in theory that was as accurate and objective a summary of that data as possible. Language could be defined as a system of vocal signals or simply as speech, writing being an incomplete representation of speech. Moreover, languages were arbitrary--not so much revealing logic, but reflective of changing customs, times, and places. Defining the phoneme would involve primarily articulatory and accoustical conditions; the closer we could stay to what was retrievable from the sound stimulus, the more precise and objective would be our account. For Bloomfield the definition of the phoneme would hopefully come out of the laboratory.

In the structural tradition, scientific methodology demanded only the "study of phenomena and their correlations"[3] (Waddell). Mentalistic assumptions were fraudulent. Linguistic description should be characterized only by consistency, convertibility, and, perhaps, simplicity and convenience.[4] The subjective definitions of grammatical units were to be replaced by those which recognized the observable signals in grammatical structure. For many (most?) mixing linguistic levels was taboo, and for certain purists in the tradition the ultimate in objectivity would be a grammar whose structures are kept apart by means of audible differences in the sound stimulus--in stress, pitch, and juncture. Such a grammar appeared in 1958 (Archibald Hill).

All this would be accomplished in the name of science, or to use Kuhn's expression designating the going body of scientific

assumptions implicit at a given time--'normal science'. Of course, there were exceptions to the trend. Certain important assumptions of Sapir became and remained unpopular. As far back as the 1940's Pike was holding out for grammatical prerequisites to phonemic analysis. And Jakobson's feature analysis, with its implications for the universal, was later to be used by the revolutionists. But the main lines identifying theory construction in this country are quite discernible, and they are also reflected in the kinds of questions taken into the laboratory.

Laboratory questions would fit the theoretical formulations suggested above. Typical were experiments calling for response to differences in plus juncture involving grammatical boundaries. Some tests inquired into what part pitch and stress play in identifying and contrasting syntactic structures. Attention to the role of sound features establishing phonemes extended from features characteristic of phones and allophones to conditioning factors related to the immediate sound environment. Amid exaggerated claims, positive contributions to an understanding of sound phenomena resulted from these investigations. However, we here wish to note the limitations imposed on experimentation by the paradigm concerns of a rather strict empirical science. For example, rarely would one find, among the mass of recorded experiments on sounds, an experiment testing for the effects of broader contexts upon the sound. Outside the country, some research by Bruce[5] in England and Mol[6] in Holland proved exceptions. The same restrictions on experimentation did not apply in these cases. American psychologist George Miller experimented

with sequential constraints in perception and recall of strings of words, but later realized that even this assumed too narrow a context for determining psycholinguistic primes.[7]

It is again important to emphasize that the answers derivable from an experiment are restricted to the questions one is willing to ask, so that even negative answers are negative in respect to these questions. The structuralist's questions were reflective of his paradigm, which, in turn, circumscribed the significance of the answers forthcoming from the laboratory. Thus, though one could test for the relative importance of certain sound features or contrasts over others, he could not, within this paradigm, test for the effects of higher level (syntactic and semantic) constraints on phoneme identity. Doing so might jeopardize the concept of the phoneme that tests were meant to validate. To this extent the structuralist was hindered from determining the role sound played, while his autonomous phoneme exaggerately attempted to do just that. To ask the larger, contextual question could not only challenge conventional concepts of the phoneme, but also the paradigm base from which it developed. Kuhn puts the matter in historical perspective when he states:

> No part of the aim of normal science is to call forth new sorts of phenomena; indeed, those that will not fit the box are often not seen at all. Nor do scientists normally aim to invent new theories, and they are often intolerant of those invented by others. Instead normal scientific research is directed to the articulation of those phenomena and theories that the paradigm already supplies.[8]

Grammar texts espousing structural linguistics concentrated on surface features involving word order, structure words,

inflections, intonation, etc. The distribution of an item in various contexts was sometimes called on in order to 'objectively' identify its syntactic role, although some recognized the 'subjective' circularity of this procedure.

Introductory textbooks in linguistics, in keeping with the heavily attended-to area of sound phenomena largely emanating from the directive in science influencing this attention, introduced the student to phonology first, and then extended this introduction over a disproportionate part of the book. It is hardly necessary to say how the grammar was accounted for, although the same degree of emphasis was not accorded the varying surface features from one text to another. Positively speaking, benefits which accrued from these attempts include the examination of language features that had been largely neglected, scarcely explored, or unsystematically described; but the limitations governing what was to be studied and how--what was methodologically respectable--are quite in evidence. What was 'fact', moreover, was to no small degree informed by the principles that developed from the then normal science of linguistics in America.

In teaching English to non-native speakers--or teaching any foreign language--we were to emphasize the differences between languages as these suggested interference problems in the areas of sound, syntax, and vocabulary. And in the matter of teaching-technique the positivistically oriented linguist found the similarly inclined behavioral psychologist to be a good bedfellow. Stimulus, response, reinforcement, generalization,

and habit formation were the stock in trade of the behaviorist; to the linguist these had the advantage of dealing with the observable--overt 'causes' and overt 'effects'--expressing essentially the same conceptual framework in science that the linguist was accustomed to. Language behavior, like other kinds of behavior in animals and men, was 'habit forming.' Pattern practice would help establish new habits in the acquisition of the foreign language.

The structuralist's contribution to the subject of Reading reflects his phonological emphasis. Spelling patterns highlighted phoneme/grapheme correlations, as did such attempts as the International Teaching Alphabet. The prevailing notion of language composed of building blocks from sound to sense is reflected in assumptions about the reading process. Thus it appeared important to those using a spelling pattern approach that beginning readers first perceive the grapheme in the syllable pattern of the word, and having so identified it to determine the phoneme which it represents before going up the ladder to levels of syntax and semantics. At least, 'reading for meaning' was considered misguided until and unless the alphabetic (phonemic) principle had been conquered. The effectiveness of materials employing these principles may now be established as this applies to certain situations, but their overall effectiveness or necessity is largely a function of the degree of insight involved in the theoretical claims that underlie them.

Enter Noam Chomsky and the revolution. The unresolved anomalies and the felt inadequacies of the 'limited' appeal in

science to account for many phenomena or to support much of the aforementioned theory laid the groundwork for change. A positive approach (the transformational-generative model) to the solution of several of these problems favored the upcoming revisionists. The ongoing revolution in linguistics, with its 'new' (renewed) stance in science, is the result. Although something of the method, certain of the findings, and much of the rigor of the structuralists have been taken over by the revolutionists, the degree of change is phenomenal. The extent to which Chomsky's position in rationalism and the modern linguist's position in empiricism are compatible is controversial, but the changes in theoretical direction and in practical consequences are revolutionary. It is important at this point briefly to sketch the shift in emphasis, and then to see how this has affected applications.

The innate is now receiving much attention, as are universal features that identify all languages and contribute to the uniqueness of man as <u>the</u> language possessor among creatures. Accompanying an admission of much ignorance as to language acquisition, exposure to language (stimuli and reinforcement) is viewed as a condition necessary to draw out (trigger) rules and relationships that have a genetic origin.

The linguistic explanation of sentences currently involves underlying and surface structure. (In the latest revision, the deepest structure is conceptual entailing unordered roles of a semantic nature.) The notion of grammaticality, which appeals to the intuition to judge the well-formedness of sentences, made

its entrance amid continued accusations of mentalism.

The claim has also been made that a developing science must go beyond observational adequacy and even descriptive adequacy to explanatory adequacy, though for some these concepts are not easily separable, and the structuralist within his perspective may have often thought himself to have travelled the route all the way to explanation. Moreover, it has become abundantly clear that what is "added" by the new paradigm is no mere accretion, but a reevaluation and reordering of the data.

Receiving increasing emphasis is the creative aspect of language use which is said to allow even the pre-school child to understand and produce one novel sentence after another, apparently defying explanation in behavioristic terms. These 'facts' also reflect the essential difference between animal message systems and language. Behavioral concepts such as analogy and generalization are regarded as empty of content (i.e. scientifically vacuous according to their usual definitions). And reflecting on complex systems such as the mind of man, with its innate 'knowledge' of language, Chomsky finds evolutionary explanations equally vacuous.[9]

Since languages share universal features, roles, rules, and relationships, they together reflect language. Languages, then, are essentially the same, however much they may differ or appear to differ. All demonstrate a kind of language-logic. Therefore, the concept of linguistic relativity, especially in its strong form, is seen to be a gross exaggeration that underplays both the commonality of all languages and man's consequent

rule-governed freedom through language to transcend customs and conventions.

Automonous phonemics has been replaced by systematic phonemics (morphophonemics), since the former is a product of forced conclusions from the data, motivated by circumscribed attention to sound features and sound environments, which motivation is attributed to the narrow concerns of a limited view of science. Postal puts the matter in sharp focus when he writes:

> Theoretical positions are defined largely by the questions they ask. The great limitations of autonomous phonemics are due to asking the wrong ones. The fundamental question which autonomous phonemics has asked is, essentially, how may a description systematically distinguish those phonetic features which differentiate contrasting forms from those which do not. Metaphorically 'how are utterances kept apart by sound?' This question turns out to be wrong because it involves many implicit assumptions which turn out to be false, assumptions which exclude complete overlapping, which entail the nonlogical truth that phonetic contrasts directly yield phonological contrasts, and which insist that phonological structure is independent of grammar and completely based on phonetic considerations.

On the previous page, the same author cites the structuralist's "attempt to view sound change as a physical, phonetic phenomenon having to do with the performance process of articulation" as largely an error "motivated by underlying physicalist, positivist, behaviorist, and antimentalist tendencies" obscuring "the rule character of sound change."[10]

The "rule character" of language applies to competence which is to be distinguished from performance, though the former plays a major role in the realization of the latter. This is a significant departure from the 'older' paradigm's conception of language as a system of vocal signals, or its identification of

language with speech.

Experimental problems have correspondingly changed to accommodate the paradigm shift. Research on universals predominates; that on language differences recedes, except where the latter shed light of the former. Before the 'new look', subjects were requested to extend their power of perception to alleged stress contrasts such as on the up in pairs like: They ran up a bill/They ran up a hill; or to differentiate "market" from "mark it" by recognizing an external open juncture in the last case but not in the first. But with the new directive for research, the subject's ability to realize two interpretations of strings like "flying airplanes can be dangerous" is shown to depend on no necessary difference in the physical stimulus, but on a built-in knowledge of grammatical possibilities for that string, involving different underlying rules. Thus, where differences between grammatical structures consistently correlate with intonational contrasts, the latter merely cooperate with the assignment of possible structure(s) to help identify the grammar of the sentence.

Typical of the influence of the now popular paradigm on laboratory efforts is an experiment which, among other things, locates clocks within segments to see if the hearer will relocate them at major segment boundaries in spite of their physical occurrence elsewhere.[11] One experiment, testing for syntactic and semantic constraints on the perception and free recall of varying strings of words, finds G. Miller conceding that the results are common sense, yet discouraging if one's "theory of

speech perception requires solution at the level of phonetics, words or nonsense syllables."[12] The limited concerns of pre-revolution psycholinguists as these informed experimentation undoubtedly motivated Miller--himself once a devoted behaviorist--to make the quoted comment.

Revolutionary grammar books produced at all levels, from elementary through college, reflect different stages of transformational revision; but during the crisis period, when both paradigms were striving for the limelight, some books combined material from the earlier paradigm with what was available and/or seemed appropriate from the revolutionists. A reviewer would then point out that the premises of the one were frequently incompatible with those of the other. Recent texts may summarize stages in the development of transformational-generative grammar and then begin to apply the latest revision to a description of the generation of sentences. But there is now hardly any trace of a change in problems due to the changed perspective in science. This is normal for textbooks, but Kuhn indicts them for masking revolutions in this manner. Such disguise contributes in no small way to the layman's and practitioner's distorted view of science--to the notion that science simply advances by means of accretions in a strictly cumulative way.[13] It tends to perpetuate the notion that science merely states facts, is dispassionate, detached, and impersonal. Besides Kuhn's work and our own experience in the recent history of linguistics, Michael Polanyi's "Personal Knowledge"[14] contributes in a sophisticated way to the dispelling of such popularly held ideas.

In the area of language learning, the sequence of stimulus, response, reinforcement, habit formation presents itself as quite misguided by the rationalist's assumptions. In opposition to others, T. Grant Brown defends the continued use of pattern practice but acknowledges that its original basis in theory is quite faulty according to current concepts, especially those of the neo-transformationalists (generative semanticists), and that its foundation in behavioristic psychology must be recognized as too simplistic. He argues, however, that the concept of pattern practices can be salvaged and made to fit current theory if these practices are seen to perform the task of "reorganizing automatic cognitive processes," rather than "forming a new habit system."[15] Here again, practice is seen as outgrowth of paradigm, although in this case, if Brown is right, the differing outlooks allow for the same teaching device.

With the demise of the autonomous phoneme, the attempts in reading materials to match phoneme to grapheme or to present similarly motivated spelling patterns is seen as ill-conceived and rarely necessary, since conventional orthographic symbols represent feature sets in an underlying sound system. These, in turn, are employed by the higher level structures that the child uses while reading. Thus, the altered 'facts' concerning phonology in theoretical linguistics have their consequences in altered 'facts' on how the reading process transpires and what materials are desirable for use.

As the definitions, methods, and goals related to science change from those of the pre-revolutionary linguist to those of the revolution (or post-revolution) a battle of words ensues over

who is really'doing' science. Kuhn reveals that in such cases the supporters of one paradigm often refer to the adherents of the other one as unscientific, speculative, or metaphysical.[16] This has a familiar ring in the recent history of linguistics. Thus, Hockett finds the followers of Chomsky to have "abandoned 'scientific linguistics' in favor of the speculations of a neo-medieval philosopher"[17] (i.e. the rationalism of Descartes). However, Chomsky claims that the Modern Linguist "shares the delusion that the modern 'behavioral sciences' have in some essential respect achieved a transition from 'speculation' to 'science'."[18] Moreover, Chomsky refers to the "behaviorists' account of language use and acquisition" as "pure mythology,"[19] while the chief spokesman for that account (B. F. Skinner) regards mentalistic psychology to be nonexistent and decries Chomsky's reintroduction of the concepts of mind and the innate. To Skinner such ideas are parts of a conglomerate which he blesses (?) with the label "mythical machinery."[20] Yet it is well known that Skinner claims objectivity and science for his own operant behaviorism and denies being involved with metaphysics.

The preceding indicates a final relationship of paradigm to practice--the practice of attributing science to one's own paradigm commitment and speculation or myth to that of the opposition. Chomskyian (and post-Chomskyian) linguistics can be regarded as both older and newer than structuralism. Each has charged the other with being out-of-date--a suggested correlate of its less-than-scientific, mythological character. Kuhn's remarks at this point are instructive:

> If these out-of-date beliefs are to be called myths, then myths can be produced by the same sorts of methods and held for the same sorts of reasons that now lead to scientific knowledge. If, on the other hand, they are to be called science, then science has included bodies of belief quite incompatible with the ones we hold today. Given these alternatives, the historian must choose the latter. Out-of-date theories are not in principle unscientific because they have been discarded. That choice, however, makes it difficult to see scientific development as a process of accretion.[21]

It is here contended that these charges and counter-charges of myth and out-of-dateness have their source in a pre-scientific choice of paradigm. The chosen paradigm not only serves as directive for scientific endeavor, but also as judge over what is and what is not to be taken as science.

By way of summary and conclusion, it bears reemphasis that the mode of abstraction and directive for research will indicate the paradigm bias of the linguistic scientist (or any scientist); that this directive must be critically appraised for the way it informs theory, fact, research, and application; that the ultimate criterion for evaluation cannot incontrovertibly be an appeal to the variously interpreted concept 'science'; that the critic must thereby be aware of his pre-scientific grounds for judgment; and that no amount of proof, reason, reference to explanatory power, etc., commands the acceptance of a new paradigm. Instead, as Kuhn has established through extensive research into the nature of scientific revolutions, to pass from one paradigm to another requires that one be converted.[22] In other words, to go along with a paradigm shift necessitates a leap of faith. Nevertheless, an increase in knowledge is often the contribution

of ongoing research representing scientific endeavor exemplifying a 'new' paradigm. Moreover, distortion seems especially to characterize those starting points that unduly restrict analysis and research. Therefore, since the transformational (and neo-transformational) model probes more deeply into the reality of language, often compensating for the inadequacies of the structural approach to account for the data, it is to be preferred. These richer theories illustrate advance through their incomplete and provisional demonstration of the laws of language on a global scale. However, the charge of onesideness as this applies to the now dominant perspective(s) is not easily answered. To the extent that it cannot be answered, the current 'rationalist' efforts must also be viewed as too limiting to satisfactorily account for the phenomena (language) they are attempting to explain. With that observation a rereading of the first paragraph of this paper constitutes an appropriate finale.

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